Journal Contents

VOLUME 49, 1970

	Page
January	
Survey .. .. facing	A6
Notice of Annual General Meeting	1
Minutes of Annual General Meeting, 23rd January, 1969	2
Election of Members of Council 1969–70	3
Report of Council, 1st July, 1968 to 30th June, 1969 ..	4
"Computer Simulation Techniques for Production Production Management", by J. A. Smith, DIC, MIProdE, AMBIM, AMInstF	19
World Federation of Engineering Organisations ..	25
Council of Engineering Institutions News	26
Institution Notex	27
News of Members	30
Production Engineering Abstracts	34
New Production Equipment and Materials	39
February	
Survey .. .. facing	A6
Co-operation of Disciplines—Speeches at the Annual Dinner	45
The 1969 George Bray Memorial Lecture	
"A Survey of Group Technology and its Potential for User Application in the UK", by F. R. E. Durie	51
"Modern Steel Production Techniques", by W. K. Phillips	62
The 1969 Viscount Nuffield Memorial Paper	
"Our Technological Future", by G. A. H. Cadbury, MA —Report of the Discussion	69
Correspondence	77
Institution Notes	79
News of Members	82
Production Engineering Abstracts	86
New Production Equipment and Materials	91
March	
Survey .. .. facing	A4
"Government and Industry in the 70's", by The Rt Hon Anthony Wedgwood Benn, MP	97
The 1969 Sir Alfred Herbert Paper	
"International Marketing", by The Rt Hon Lord Stokes of Leyland, TD, DL, LID, DTech, CEng, FIMechE, MSAE, FIMI	102
The 1969 George Bray Memorial Lecture	
"A Survey of Group Technology and its Potential for User Application in the UK", by F. R. E. Durie —Report of the Discussion	108
"Motivation for Quality", by B. W. Jenney, PhD, BA(Econ), CEng, MIProdE, MIMechE, AMBIM, MIEI	117
PERA Quarterly Newsletter	121
Council of Engineering Institutions News	123
Institution Notes	125
Hazleton Memorial Library—Reviews and Additions	126
News of Members	128
Production Engineering Abstracts	130
New Production Equipment and Materials	135
April	
Survey .. .. facing	A6
Chartered Engineers in Westminster	141
Machine Tool EDC Economic Assessment Report ..	142
"Stimulation of Effort", by I. L. H. Scott, BEngSc, CEng, MIMechE, MORS, MIE(Aust), MIMC ..	143
The 1969 Sir Alfred Herbert Paper	
"International Marketing", by The Rt Hon Lord Stokes of Leyland, TD, DL, LID, DTech, CEng, FIMechE, MSAE, FIMI—Report of the Discussion	155
"Industrial Diagnosis", by N. K. Powell, BSc, CEng, MIMechE, FIWM	162
Institution Notes	165
Correspondence	168
News of Members	169
Register of Chartered Engineers	172
Hazleton Memorial Library—Reviews and Additions ..	173
Production Engineering Abstracts	176
New Production Equipment and Materials	182
May	
Survey .. .. facing	A4
The E. Percy Edwards Paper 1970	
"The Computer as an Interface Between Man and Machine", by The Rt Hon The Earl of Halsbury, FRS, CEng, FIProdE, FInstP, MSME	189
"Optimisation of Parameters in Turning", by J. D. Radford, BSsEng, DipEngProd, FIProdE, MIMechE and D. B. Richardson, DIC, FIProdE, MIMechE, AMBIM	197
"Labour-Turnover and Absenteeism", by W. H. Chan	202
PERA Quarterly Newsletter	211
News from the Education and Membership Department	212
Institution Notes	213
Correspondence	217
News of Members	218
Membership Elections and Transfers approved by Council at a meeting on 29th January, 1970 ..	221
Hazleton Memorial Library—Reviews and Additions ..	223
Production Engineering Abstracts	225
New Production Equipment and Materials	229

Journal Contents

VOLUME 49, 1970

	Page
January	
Survey .. .. facing	A6
Notice of Annual General Meeting	1
Minutes of Annual General Meeting, 23rd January, 1969	2
Election of Members of Council 1969–70	3
Report of Council, 1st July, 1968 to 30th June, 1969 ..	4
"Computer Simulation Techniques for Production Production Management", by J. A. Smith, DIC, MIProdE, AMBIM, AMInstF	19
World Federation of Engineering Organisations ..	25
Council of Engineering Institutions News	26
Institution Notex	27
News of Members	30
Production Engineering Abstracts	34
New Production Equipment and Materials	39
February	
Survey .. .. facing	A6
Co-operation of Disciplines—Speeches at the Annual Dinner	45
The 1969 George Bray Memorial Lecture	
"A Survey of Group Technology and its Potential for User Application in the UK", by F. R. E. Durie	51
"Modern Steel Production Techniques", by W. K. Phillips	62
The 1969 Viscount Nuffield Memorial Paper	
"Our Technological Future", by G. A. H. Cadbury, MA —Report of the Discussion	69
Correspondence	77
Institution Notes	79
News of Members	82
Production Engineering Abstracts	86
New Production Equipment and Materials	91
March	
Survey .. .. facing	A4
"Government and Industry in the 70's", by The Rt Hon Anthony Wedgwood Benn, MP	97
The 1969 Sir Alfred Herbert Paper	
"International Marketing", by The Rt Hon Lord Stokes of Leyland, TD, DL, LID, DTech, CEng, FIMechE, MSAE, FIMI	102
The 1969 George Bray Memorial Lecture	
"A Survey of Group Technology and its Potential for User Application in the UK", by F. R. E. Durie —Report of the Discussion	108
"Motivation for Quality", by B. W. Jenney, PhD, BA(Econ), CEng, MIProdE, MIMechE, AMBIM, MIEI	117
PERA Quarterly Newsletter	121
Council of Engineering Institutions News	123
Institution Notes	125
Hazleton Memorial Library—Reviews and Additions	126
News of Members	128
Production Engineering Abstracts	130
New Production Equipment and Materials	135
April	
Survey .. .. facing	A6
Chartered Engineers in Westminster	141
Machine Tool EDC Economic Assessment Report ..	142
"Stimulation of Effort", by I. L. H. Scott, BEngSc, CEng, MIMechE, MORS, MIE(Aust), MIMC ..	143
The 1969 Sir Alfred Herbert Paper	
"International Marketing", by The Rt Hon Lord Stokes of Leyland, TD, DL, LID, DTech, CEng, FIMechE, MSAE, FIMI—Report of the Discussion	155
"Industrial Diagnosis", by N. K. Powell, BSc, CEng, MIMechE, FIWM	162
Institution Notes	165
Correspondence	168
News of Members	169
Register of Chartered Engineers	172
Hazleton Memorial Library—Reviews and Additions ..	173
Production Engineering Abstracts	176
New Production Equipment and Materials	182
May	
Survey .. .. facing	A4
The E. Percy Edwards Paper 1970	
"The Computer as an Interface Between Man and Machine", by The Rt Hon The Earl of Halsbury, FRS, CEng, FIProdE, FInstP, MSME	189
"Optimisation of Parameters in Turning", by J. D. Radford, BSsEng, DipEngProd, FIProdE, MIMechE and D. B. Richardson, DIC, FIProdE, MIMechE, AMBIM	197
"Labour-Turnover and Absenteeism", by W. H. Chan	202
PERA Quarterly Newsletter	211
News from the Education and Membership Department	212
Institution Notes	213
Correspondence	217
News of Members	218
Membership Elections and Transfers approved by Council at a meeting on 29th January, 1970 ..	221
Hazleton Memorial Library—Reviews and Additions ..	223
Production Engineering Abstracts	225
New Production Equipment and Materials	229

June

Survey .. .. facing A4
CEI Views on the Haslegrave Report 235
"Cutting Oils and the Production Engineers, by F. Croxon, BSc, LIM 237
"Thermo-Forming Materials, Machines and Methods Part (2)", by S. W. Fagence 247
"Metrication, Decimalisation and Anomalous Rounding Procedures", by P. C. T. Willey, BSc, CEng, MIProdE 255
"News from the Education and Membership Department 258
Correspondence 259
"Peru—Some Impressions", by F. W. Cooper, BSc, CEng, FIMechE, FIProdE 260
Institution Notes 262
News of Members 263
Hazleton Memorial Library—Reviews and Additions .. 266
Production Engineering Abstracts 267
New Production Equipment and Materials 272

July

Survey .. .. facing A6
Happy New Year—A message from the President .. 279
Principal Officers 1970–71 280
"Automatic Assembly Tomorrow", by Professor W. B. Heginbotham, BSc, MSc, PhD, FIProdE, MIMechE 282
"A Statistical Analysis of Machining Variables", by G. R. Braithwaite, MSc, FSS, FIMA and A. G. Hague, BSc, MIMechE, FIProdE 289
"Canada's Immigrant Engineers", by J. Brooksbank, PEng, CEng, MIMechE, FIProdE, MEIC 299
First International Conference on Production Research 305
Institution Notes 306
Correspondence 308
News of Members 309
Production Engineering Abstracts 311
Hazleton Memorial Library—Reviews and Additions .. 315
New Production Equipment and Materials 317

August

Survey .. .. facing A6
CEI Board Pass Resolutions for Composite Engineering Register 323
Seminar on "Drop Forging for Modern Manufacture"
"Scope of the Drop Forging Industry", by K. J. Abbott, FIEI, MInstW 324
"Design of Logical Systems—Part 1", by D. W. Lewin, BTech, MSc, CEng, FBCS, AInstP, MIERE, MInstMC 333
"Production Engineering in Peru", by Professor R. N. Marland, BSc, CEng, FIProdE, MIMechE .. 340
PERA Quarterly Newsletter 345
Institution Notes 348
News of Members 350
Membership Elections and Transfers approved by Council at a meeting on 30th April, 1970 353
Production Engineering Abstracts 356
New Production Equipment and Materials 360

September

Survey .. .. facing A4
Graduate Training in Manufacturing Technology .. 367
CEI News 368
Seminar on "Drop Forging for Modern Manufacture"
"Hot Forging Processes", by R. E. Winch 369
"Drop Forging Design", by F. T. Walker 376
"Design of Logical Systems—Part 2", by D. W. Lewin, BTech, MSc, CEng, FBCS, AInstP, MIERE, MInstMC 383
Institution Notes 391
News of Members 395
Register of Chartered Engineers 398
Hazleton Memorial Library 399
Production Engineering Abstracts 401
New Production Equipment and Materials 407

October

Survey .. .. facing A6
Responsibility and Salary Levels for Professional Engineers 413
The 1970 E. W. Hancock Paper
"Trade Unions in Perspective", by Victor Feather, CBE 414
Seminar on "Drop Forging for Modern Manufacture"
"Forgings for the Automobile Industry", by A. C. Swindle, CEng, FIProdE 421
"Forgings for Aircraft Engines", by D. G. Iles, CEng, MIProdE, AMBIM 429
"Postgraduate Training for Production—The Case for Graduate Training", by P. H. Lowe, BSc(Econ), BSc(Eng), CEng, MIMechE, AMBIM 435
Institution Notes 437
Correspondence 439
News of Members 440
Production Engineering Abstracts 442
New Production Equipment and Materials 447

November

Survey .. .. facing A6
Golden Jubilee Dinner—Report of the speeches .. 453
The 1970 George Bray Memorial Lecture
"Financial Opportunities for Small Companies in the Production Engineering Field", by M. G. Wright, BCom, ARCA, FCIS 460
"The Development of Higher Machining Speeds—Part 1", by G. Arndt, MEngSc, BE(Mech), DipProdE, DipMechE, CEng, MIProdE, GIEAust. 470
"Criticism of the Council of Engineering Institutions Requirements for 'Production Technology'," by P. J. Thompson, BSc, MSc, CEng, MIProdE, MIMechE and N. A. Butterworth, MSc, CGIA, CEng, FIProdE, FIMechE 478
PERA Quarterly Newsletter 481
News of Members 484
Institution Notes 486
Hazleton Memorial Library 488
Membership Elections and Transfers approved by Council at a meeting on 23 July, 1970 490
Production Engineering Abstracts 492
New Production Equipment and Materials 497

December
Survey .. .. facing A6
Machine Tool Marketing—Machine Tools EDC Report 503
Seminar on "Drop Forging for Modern Manufacture"
"Drop Forging—The Impact of Research", by S. E. Rogers, BSc, PhD, ARIC 505
"Economic Batch Quantities of Machined Items", by G. J. Borthwick, MSc 513
"The Development of Higher Machining Speeds—Part 2", by G. Arndt, MEngSC, BE(Mech), DipProdE, DipMechE, CEng, MIProdE, GIEAust. 517
Institution Notes 530
Correspondence 530
News of Members 531
Production Engineering Abstracts 533
Hazleton Memorial Library 539
New Production Equipment and Materials 541
Journal Contents—Volume 49, 1970 548
Subject Index to Material Published—1970 550
Author/Title Index to Material Published—1970 .. 551

Subject index to material published - 1970

Absenteeism. Labour-turnover, *202*.
Anomalous rounding procedures, *255*.
Automatic assembly, *282*.

George Bray Memorial Lecture, 1969, *51* and *108*.
George Bray Memorial Lecture, 1970, *460*.

Computer as an interface, *189*.
Computer simulation techniques for production management, *19*.
Cutting oils, *237*.

Drop forging: Aircraft engines, *429*.
Drop forging: Automobile industry, *421*.
Drop forging design, *376*.
Drop forging: Hot processes, *369*.
Drop forging industry: Scope, *324*.
Drop forging: Research, *505*.

Economic batch quantities, *513*.
E. Percy Edwards Paper, 1970, *189*.

Government and industry, *97*.
Group technology: Survey of potential for user application, *51*.

E. W. Hancock Paper, 1970, *414*.
Alfred Herbert Paper, 1969, *102* and *155*.

Labour-Turnover and absenteeism, *202*.
Logical systems: Design. Part 1, *333*. Part 2, *383*.

Machine Tool EDC. Economic assessment report, *142*.
Machining speeds: Development of higher. *470* and *517*.
Machining variables: Statistical analysis, *289*.
Marketing: International, *102*.
Motivation for quality, *117*.

Viscount Nuffield Memorial Paper, 1969 (Discussion), *69*.

Production management: Computer simulation techniques, *19*.

Quality: Motivation for, *117*.

Rounding procedures: Anomalous, *255*.

Steel production techniques, *62*.

Technological future, *69*
Thermo-forming, *247*.
Trade unions in perspective, *414*.
Training: Postgraduate, *435*.
Turning: Optimisation of parameters, *197*.

World Federation of Engineering Organisations, *25*.

Author/title index to material published - 1970

ABBOTT, K. J. Scope of the drop forging industry. (Seminar on Drop Forging for Modern Manufacture). August, 324.

ARNDT, G. The development of higher machining speeds. Part 1, November, 470. Part 2, December, 517.

Automatic assembly tomorrow (Heginbotham). July, 282.

BENN, A. WEDGWOOD. Government and industry in the 70's. March, 97.

BORTHWICK, G. J. Economic batch quantities of machined items. December, 513.

BRAITHWAITE, G. R. and HAGUE, A. G. A statistical analysis of machining variables. July, 289.

BROOKSBANK, J. Canada's Immigrant engineers. July, 299.

BUTTERWORTH, N. A. and THOMPSON, P. J. Criticisms of the Council of Engineering Institutions requirements for "Production Technology." November, 478.

CADBURY, G. A. H. Our technological future. (1969 Viscount Nuffield Memorial Paper). Discussion. February, 69.

Canada's immigrant engineers (Brooksbank). July, 299.

CHAN, W. H. Labour—turnover and absenteeism. May, 202.

The computer as an interface between man and machine (Halsbury). May, 189.

Computer simulation techniques for production management (Smith). January, 19.

COOPER, F. W. Peru—some impressions. June, 260.

Co-operation of disciplines (Annual Dinner). February, 45.

Criticisms of the Council of Engineering Institutions requirements for "Production Technology." (Thompson *and* Butterworth). November, 478.

CROXON, F. Cutting oils and the production engineer. June, 237.

Cutting oils and the production engineer (Croxon). June, 237.

Design of logical systems (Lewin) Part 1, August 333. Part 2, September, 383.

Development of higher machining speeds (Arndt). Part 1, November, 470. Part 2, December, 517.

Drop forging design (Walker). September, 376.

Drop forging—the impact of research (Rogers). December, 505.

DURIE, F. R. E. A survey of group technology and its potential for user application in the U.K. (1969 George Bray Memorial Lecture). February, 51. Discussion, March, 108.

Economic batch quantities of machined items (Borthwick). December, 513.

FAGENCE, S. W. Thermo-forming materials, machines and methods (Part 2). June, 247.

FEATHER, V. Trade unions in perspective (1970 E. W. Hancock Paper). October, 414.

Financial opportunities for small companies in the production engineering field (Wright). November, 460.

Forgings for aircraft engines (Iles). October, 429.

Forgings for the automobile industry (Swindle). October, 421.

Government and industry in the 70's (Benn). March, 97.

HAGUE, A. G. *and* BRAITHWAITE, G. R. A statistical analysis of machining variables. July, 289.

HALSBURY, THE EARL OF. The computer as an interface between man and machine (E. Percy Edwards Paper 1970). May, 189.

HEGINBOTHAM, W. B. Automatic assembly tomorrow. July, 282.

Hot forging processes (Winch). September, 369.

ILES, D. G. Forgings for aircraft engines. (Seminar on Drop Forging for Modern Manufacture). October, 429.

Industrial diagnosis (Powell). April, 162.

International marketing (Stokes). March, 102. Discussion, April 155.

JENNEY, B. W. Motivation for quality. March, 117.

Labour turnover and absenteeism (Chan). May, 202.

LEWIN, D. W. The design of logical systems—Part 1. August, 333. Part 2, September, 383.

LOWE, P. H. Postgraduate training for production—the case for graduate training. October, 435.

MARLAND, R. N. Production engineering in Peru. August, 340.

Metrication, decimalisation, and anomalous rounding procedures (Willey). June, 255.

Modern steel production techniques (Phillips). February, 62.

Motivation for quality (Jenney). March, 117.

Optimisation of parameters in turning (Radford *and* Richardson). May, 197.

Our technological future (Cadbury). Discussion. February, 69.

Peru—some impressions (Cooper). June, 260.

PHILLIPS, W. K. Modern steel production techniques. February, 62.

Postgraduate training for production—the case for graduate training (Lowe). October, 435.

POWELL, N. K. Industrial diagnosis. April, 162.

Production engineering in Peru (Marland). August, 340.

RADFORD, J. D. *and* RICHARDSON, D. B. Optimisation of parameters in turning. May, 197.

Report of Council. 1st July, 1968 to 30th June, 1969. January, 4.

ROGERS, S. E. Drop forging—the impact of research (Seminar on Drop Forging for Modern Manufacture). December, 505.

Scope of the drop forging industry (Abbott). August, 324.

SCOTT, I. L. H. Stimulation of effort. April, 143.

SMITH, J. A. Computer simulation techniques for production management. January, 19.

Statistical analysis of machining variables (Braithwaite *and* Hague). July, 289.

Stimulation of effort (Scott). April, 143.

STOKES, LORD, International marketing (Sir Alfred Herbert Paper, 1969). March, 102. Discussion, April, 155.

Survey of group technology and its potential for user application in the U.K. (Durie). February, 51. Discussion. March, 108.

SWINDLE, A. C. Forgings for the automobile industry. (Seminar on Drop Forging for Modern Manufacture). October, 421.

Thermo-forging materials, machines and methods. (Part 2) (Fagence). June, 247.

THOMPSON, P. J. *and* BUTTERWORTH, N. A. Criticisms of the Council of Engineering Institutions requirements for "Production Technology." November, 478.

Trade unions in perspective (Feather). October, 414.

WALKER, F. T. Drop forging design. (Seminar on Drop Forging for Modern Manufacture). September, 376.

WILLEY, P. C. T. Metrication, decimalisation and anomalous rounding procedures. June, 255.

WINCH, R. E. Hot forging processes. (Seminar on Drop Forging for Modern Manufacture). September, 369.

WRIGHT, M. G. Financial opportunities for small companies in the production engineering field (1970 George Bray Memorial Lecture). November, 460.